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25 <210> 60

27 <211> 9

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42 <211> 12

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40 Arg Lys His Arg
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5 Ala Asn Asp Ile
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Arg His Asp Glu
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<211> 20

15 <212> PRT

<213> human cytomegalovirus pp65 CTL epitope peptide

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Val Pro Met Val
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Asn Leu Lys Tyr
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Ser Gly Lys Leu
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Ala Val Ile His
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Leu Gln Arg Gly
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15 Thr Ser His Glu
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55 Tyr Leu Glu Ser
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Glu Pro Asp Val
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20 Leu Pro Gly Pro
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40 Asp Asp Val Trp
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5 Thr Ser Gly Val
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10 <211> 20

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25 Lys His Arg Gly
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30 <211> 20

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45 His Val Val Cys
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Pro Lys Asn Met
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Asn Val His His
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Val Phe Pro Thr
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35 <210> 93

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Asp Glu Glu Leu
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15 Arg Lys Ser Ala
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55 <210> 97

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15 <210> 98
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20 <210> 102
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15 <211> 9

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20 <210> 109
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25 <210> 113

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Arg Pro Leu Ile
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Gly Cys Ser Gln
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25 <212> PRT

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<211> 9

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50

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30 <211> 9

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5 <210> 128

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25 <210> 261

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<212> PRT

30 <213> human cytomegalovirus IE2 CTL epitope peptide

35 <400> 261

Phe Glu Gln Pro Thr Glu Thr Pro
1 5

40 <210> 262

<211> 10

<212> PRT

45 <213> human cytomegalovirus IE2 CTL epitope peptide

50 <400> 262

Phe Glu Gln Pro Thr Glu Thr Pro Pro Glu
1 5 10

55

<210> 263
<211> 9
5 <212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide

10 <400> 263
Glu Gln Pro Thr Glu Thr Pro Pro Glu
1 5
15
<210> 264
<211> 11
20 <212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide
25
<400> 264
Gln Phe Glu Gln Pro Thr Glu Thr Pro Pro Glu
30 1 5 10

<210> 265
35 <211> 9
<212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide
40

<400> 265
45 Ser Asp Tyr Asn Met Ile Ile His Ala
1 5

<210> 266
50 <211> 10
<212> PRT
55 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 266

5 Tyr Arg Asn Met Ile Ile His Ala Ala Thr
1 5 10

10 <210> 267

<211> 9

<212> PRT

15 <213> human cytomegalovirus IE2 CTL epitope peptide

20 <400> 267

20 Cys Leu Pro Leu Met Gln Lys Phe Pro
1 5

25 <210> 268

<211> 14

<212> PRT

30 <213> human cytomegalovirus IE2 CTL epitope peptide

35 <400> 268

Ile Asp Glu Val Ser Arg Met Phe Arg Asn Thr Asn Arg Ser
1 5 10

40 <210> 269

<211> 20

<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

50 <400> 269

55 Thr Ala Ala Lys Ala Tyr Ala Val Gly Gln Phe Glu Gln Pro Thr Glu
1 5 10 15

Thr Pro Pro Glu

20

5 <210> 270
<211> 20
<212> PRT
10 <213> human cytomegalovirus IE2 CTL epitope peptide

15 <400> 270
Phe Glu Gln Pro Thr Glu Thr Pro Pro Glu Asp Leu Asp Thr Leu Ser
1 5 10 15

20 Leu Ala Ile Glu
20

25 <210> 271
<211> 20
<212> PRT
30 <213> human cytomegalovirus IE2 CTL epitope peptide

35 <400> 271
Met Leu Pro Leu Ile Lys Gln Glu Asp Ile Lys Pro Glu Pro Asp Phe
1 5 10 15

40 Thr Ile Gln Tyr
20

45 <210> 272
<211> 20
<212> PRT
50 <213> human cytomegalovirus IE2 CTL epitope peptide

55 <400> 272
Thr His Gln Leu Cys Pro Arg Ser Ser Asp Tyr Arg Asn Met Ile Ile
1 5 10 15

His Ala Ala Thr
20
5

<210> 273

<211> 20
10
<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

15

<400> 273

Tyr Arg Asn Met Ile Ile His Ala Ala Thr Pro Val Asp Leu Leu Gly
20 1 5 10 15

Ala Leu Asn Leu
20
25

<210> 274

<211> 20
30
<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

35

<400> 274

Thr Gly Pro Arg Lys Lys Ser Lys Arg Ile Ser Glu Leu Asp Asn
40 1 5 10 15

Glu Lys Val Arg
20
45

<210> 275

<211> 20
50
<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

55

<400> 275

Pro Val Asp Leu Leu Gly Ala Leu Asn Leu Cys Leu Pro Leu Met Gln
1 5 10 15

5 Lys Phe Pro Lys
20

10 <210> 276
<211> 20
<212> PRT
15 <213> human cytomegalovirus IE2 CTL epitope peptide

20 <400> 276
Ile Gln Ile Ile Tyr Thr Arg Asn His Glu Val Lys Ser Glu Val Asp
1 5 10 15

25 Ala Val Arg Cys
20

30 <210> 277
<211> 20
<212> PRT
35 <213> human cytomegalovirus IE2 CTL epitope peptide

40 <400> 277
Val Lys Ser Glu Val Asp Ala Val Arg Cys Arg Leu Gly Thr Met Cys
1 5 10 15

45 Asn Leu Ala Leu
20

50 <210> 278
<211> 20
<212> PRT
55 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 278

5 Arg Val Lys Ile Asp Glu Val Ser Arg Met Phe Arg Asn Thr Asn Arg
1 5 10 15

10 Ser Leu Glu Tyr
20

<210> 279

15 <211> 20

<212> PRT

20 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 279

25 Ser Ser Ser Ser Ser Ser Cys Ser Ser Ala Ser Asp Ser Glu Ser Glu
1 5 10 15

30 Ser Glu Glu Met
20

<210> 280

35 <211> 20

<212> PRT

40 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 280

45 Ala Ser Ser Pro Ser Thr Gly Ser Gly Thr Pro Arg Asx Thr Ser Pro
1 5 10 15

50 Thr His Pro Leu
20

<210> 281

55 <211> 20

<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

5

<400> 281

10 Pro Arg Val Thr Ser Pro Thr His Pro Leu Ser Gln Met Asn His Pro
1 5 10 15

Pro Leu Pro Asp
20

15

<210> 282

20 <211> 20

<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

25

<400> 282

30 Pro Leu Gly Arg Pro Asp Glu Asp Ser Ser Ser Ser Ser Ser Ser
1 5 10 15

Cys Ser Ser Ala
20

35

<210> 283

40 <211> 20

<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

45

<400> 283

50 Ser Asp Ser Glu Ser Glu Ser Glu Glu Met Lys Cys Ser Ser Gly Gly
1 5 10 15

Gly Ala Ser Val
20

55

<210> 284
<211> 20
5 <212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide

10 <400> 284
Lys Cys Ser Ser Gly Gly Gly Ala Ser Val Thr Ser Ser His His Gly
1 5 10 15
15 Arg Gly Gly Phe
20
20 <210> 285
<211> 20
25 <212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide

30 <400> 285
Cys Thr Pro Asn Val Gln Thr Arg Arg Gly Arg Val Lys Ile Asp Glu
1 5 10 15
35 Val Ser Arg Met
20
40 <210> 286
<211> 20
45 <212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide

50 <400> 286
Phe Arg Asn Thr Asn Arg Ser Leu Glu Tyr Lys Asn Leu Pro Phe Thr
1 5 10 15
55 Ile Pro Ser Met

5 <210> 287
<211> 20
<212> PRT
10 <213> human cytomegalovirus IE2 CTL epitope peptide

15 <400> 287
His Gln Val Leu Asp Glu Ala Ile Lys Ala Cys Lys Thr Met Gln Val
1 5 10 15

20 Asn Asn Lys Gly
 20

25 <210> 288
<211> 20
<212> PRT
30 <213> human cytomegalovirus IE2 CTL epitope peptide

35 <400> 288
Cys Lys Thr Met Gln Val Asn Asn Lys Gly Ile Gln Ile Ile Tyr Thr
1 5 10 15

40 Arg Asn His Glu
 20

45 <210> 289
<211> 20
<212> PRT
50 <213> human cytomegalovirus IE2 CTL epitope peptide

55 <400> 289
Lys Ala Ala Trp Ser Leu Lys Glu Leu His Thr His Gln Leu Cys Pro
1 5 10 15

Arg Ser Ser Asp
20
5

<210> 290

<211> 20
10
<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide
15

<400> 290

Cys Leu Pro Leu Met Gln Lys Phe Pro Lys Gln Val Met Val Arg Ile
20 1 5 10 15

Phe Ser Thr Asn
20
25

<210> 291

<211> 10
30
<212> PRT

<213> human cytomegalovirus UL18 CTL epitope peptide
35

<400> 291

Gly Glu Ile Asn Ile Thr Phe Ile His Tyr
40 1 5 10

<210> 292

<211> 10
45
<212> PRT

<213> human cytomegalovirus UL18 CTL epitope peptide
50

<400> 292

55 Thr Glu Asn Gly Ser Phe Val Ala Gly Tyr
1 5 10

5 <210> 293
<211> 9
<212> PRT
<213> human cytomegalovirus UL18 CTL epitope peptide
10
<400> 293
15 Thr Met Trp Cys Leu Thr Leu Phe Val
1 5

<210> 294
20 <211> 9
<212> PRT
<213> human cytomegalovirus US2 CTL epitope peptide
25

<400> 294
30 Leu Leu Val Leu Phe Ile Val Tyr Val
1 5

<210> 295
35 <211> 9
<212> PRT
<213> human cytomegalovirus US2 CTL epitope peptide
40

<400> 295
45 Ser Met Met Trp Met Arg Phe Phe Val
1 5

<210> 296
50 <211> 10
<212> PRT
<213> human cytomegalovirus US2 CTL epitope peptide
55
56

<400> 296

5 Thr Leu Leu Val Leu Phe Ile Val Tyr Val
1 5 10

10 <210> 297

<211> 9

<212> PRT

15 <213> human cytomegalovirus US2 CTL epitope peptide

20 <400> 297

Val Tyr Val Thr Val Asp Cys Asn Leu
1 5

25 <210> 298

<211> 9

<212> PRT

30 <213> human cytomegalovirus US3 CTL epitope peptide

35 <400> 298

Tyr Leu Phe Ser Leu Val Val Leu Val
1 5

40 <210> 299

<211> 9

<212> PRT

45 <213> human cytomegalovirus US3 CTL epitope peptide

50 <400> 299

Thr Leu Leu Val Tyr Leu Phe Ser Leu
1 5

55

<210> 300
<211> 10
5 <212> PRT
<213> human cytomegalovirus US3 CTL epitope peptide

10 <400> 300
Leu Leu Phe Arg Thr Leu Leu Val Tyr Leu
1 5 10
15

<210> 301
<211> 9
20 <212> PRT
<213> human cytomegalovirus US3 CTL epitope peptide

25 <400> 301
Val Tyr Leu Phe Ser Leu Val Val Leu
30 1 5

<210> 302
35 <211> 9
<212> PRT
<213> human cytomegalovirus US11 CTL epitope peptide

40 <400> 302
Tyr Tyr Val Glu Cys Glu Pro Arg Cys
45 1 5

<210> 303
50 <211> 9
<212> PRT
<213> human cytomegalovirus US6 CTL epitope peptide

<400> 303

5 Leu Tyr Leu Cys Cys Gly Ile Thr Leu
1 5

10 <210> 304

10 <211> 10

<212> PRT

15 <213> human cytomegalovirus US11 CTL epitope peptide

<400> 304

20 Thr Leu Phe Asp Glu Pro Pro Pro Leu Val
1 5 10

25 <210> 305

<211> 9

<212> PRT

30 <213> human cytomegalovirus US11 CTL epitope peptide

35 <400> 305

Thr Pro Arg Val Tyr Tyr Gln Thr Leu
1 5

40 <210> 306

<211> 10

45 <212> PRT

<213> human cytomegalovirus US11 CTL epitope peptide

50 <400> 306

Ala Pro Val Ala Gly Ser Met Pro Glu Leu
1 5 10

55

<210> 307

<211> 9

5 <212> PRT

<213> human cytomegalovirus US11 CTL epitope peptide

10 <400> 307

Ser Glu Ser Leu Val Ala Lys Arg Tyr

1 5

15

<210> 308

<211> 9

20 <212> PRT

<213> human cytomegalovirus UL18 CTL epitope peptide

25 <400> 308

Leu Glu Leu Glu Ile Ala Leu Gly Tyr

30 1 5

<210> 309

35 <211> 241

<212> PRT

<213> synthetic polyepitope peptide

40 <400> 309

45 Val Thr Glu His Asp Thr Leu Leu Tyr Asn Leu Val Pro Met Val Ala

1 5 10 15

50 Thr Val Val Leu Glu Glu Thr Ser Val Met Leu Arg Ile Phe Ala Glu

20 25 30

Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His Glu Val Ile Met Arg

35 40 45

55 Glu Phe Asn Ser Tyr Lys Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu

50 55 60

5 Gln Tyr Asp Pro Val Ala Ala Leu Phe Tyr Val Lys Tyr Val Tyr Glu
 65 70 75 80

Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Asn Val Arg Arg Ser
85 90 95

Trp Glu Glu Leu Lys Ala Arg Asp His Leu Ala Val Leu Gln Ala Arg
100 105 110

15 Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Gln
 115 120 125

20 Ile Lys Val Arg Val Asp Met Val Glu Leu Lys Arg Lys Met Met Tyr
 130 135 140

25 Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val Tyr Glu Ile
 145 150 155 160

Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Phe
 165 170 175

Glu Gln Pro Thr Glu Thr Pro Pro Tyr Ala Tyr Ile Tyr Thr Thr Tyr
 180 185 190

35 Leu Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr Tyr Glu Gln His
195 200 205

40 Lys Ile Thr Ser Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Ser Glu
 210 215 220

45 His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Ile Arg Glu Thr Val Glu
 225 230 235 240

Leu

50

<210> 310

<211> 241

55

<212> PRT

<213> synthetic polyepitope peptide

5 <400> 310

Asn Val Arg Arg Ser Trp Glu Glu Leu Val Thr Glu His Asp Thr Leu
1 5 10 15

10

Leu Tyr Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Asn Leu Val Pro
20 25 30

15

Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val Met Leu Gln Glu
35 40 45

20 25

Pro Met Ser Ile Tyr Val Tyr Ser Glu His Pro Thr Phe Thr Ser Gln
50 55 60

Tyr Gln Ile Lys Val Arg Val Asp Met Val Glu Leu Lys Arg Lys Met
65 70 75 80

25

Met Tyr Met Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr
85 90 95

30

Arg Asn His Glu Val Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Ala
100 105 110

35

Ile Arg Glu Thr Val Glu Leu Ile Met Arg Glu Phe Asn Ser Tyr Lys
115 120 125

40 45

Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Gln Tyr Asp Pro
130 135 140

Val Ala Ala Leu Phe Lys Ala Arg Asp His Leu Ala Val Leu Tyr Val
145 150 155 160

Lys Tyr Val Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu
165 170 175

50

Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr Ala Tyr Ile Tyr Thr Thr
180 185 190

55

Tyr Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys
195 200 205

Lys Asp Glu Leu Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val
210 215 220

5

Tyr Glu Ile Lys Cys Arg Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile
225 230 235 240

10 Tyr

15 <210> 311

<211> 250

<212> PRT

20 <213> synthetic polyepitope peptide

25 <400> 311

Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asn Leu Val Pro Met Val Ala
1 5 10 15

30 Thr Val Gln Ile Lys Val Arg Val Asp Met Val Val Leu Glu Glu Thr
20 25 30

35 Ser Val Met Leu Lys Ala Arg Asp His Leu Ala Val Leu Ala Tyr Ala
35 40 45

40 Gln Lys Ile Phe Lys Ile Leu Val Thr Glu His Asp Thr Leu Leu Tyr
50 55 60

45 Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala
65 70 75 80

50 Asn Asp Ile Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Arg Ile Phe
85 90 95

55 Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His Glu Val Ile
100 105 110

55 Met Arg Glu Phe Asn Ser Tyr Lys Ser Glu His Pro Thr Phe Thr Ser
115 120 125

Gln Tyr Gln Ala Arg Leu Thr Val Ser Gly Leu Gln Tyr Asp Pro Val
130 135 140

5 Ala Ala Leu Phe Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Ala Ile
145 150 155 160

10 Arg Glu Thr Val Glu Leu Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asp
165 170 175

15 Ile Tyr Arg Ile Phe Ala Glu Leu Asn Val Arg Arg Ser Trp Glu Glu
180 185 190

20 Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Glu Leu Lys Arg Lys Met
195 200 205

25 Met Tyr Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val Tyr
210 215 220

30 Glu Ile Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val
225 230 235 240

35 Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro
245 250

40 <210> 312

45 <211> 241

<212> PRT

40 <213> synthetic polyepitope peptide

45 <400> 312

50 Asn Val Arg Arg Ser Trp Glu Glu Leu Lys Ala Arg Asp His Leu Ala
1 5 10 15

55 Val Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys
20 25 30

55 Lys Asp Glu Leu Gln Ile Lys Val Arg Val Asp Met Val Glu Leu Lys
35 40 45

55 Arg Lys Met Met Tyr Met Arg Arg His Arg Gln Asp Ala Leu Ala

50 55 60

5 Arg Val Tyr Glu Ile Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser
 65 . 70 . 75 . . 80

10 Ile Tyr Val Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr Ala Tyr
85 90 95

Il^e Tyr¹⁰⁰ Thr¹⁰¹ Tyr¹⁰² Leu¹⁰³ Gln¹⁰⁴ Glu¹⁰⁵ Phe¹⁰⁶ Phe¹⁰⁷ Trp¹⁰⁸ Asp¹⁰⁹ Ala¹¹⁰ Asn¹¹¹ Asp¹¹² Il^e

15 Tyr Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Glu Pro Met Ser Ile
 115 120 125

20 Tyr Val Tyr Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Ile
 130 135 140

25 Arg Glu Thr Val Glu Leu Val Thr Glu His Asp Thr Leu Leu Tyr Asn
 145 150 155 160

Leu Val Pro Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val Met
165 170 175

Leu Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn
180 185 190

35 His Glu Val Ile Met Arg Glu Phe Asn Ser Tyr Lys Ala Tyr Ala Gln
195 200 205

40 Lys Ile Phe Lys Ile Leu Gln Tyr Asp Pro Val Ala Ala Leu Phe Tyr
 210 215 220

45 Val Lys Tyr Val Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu
225 230 235 240

Leu

50

<210> 313

<211> 241

55

<212> PRT

<213> synthetic polyepitope peptide

5 <400> 313

Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Phe Glu Gln Pro
1 5 10 15

10

Thr Glu Thr Pro Pro Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu
20 25 30

15

Phe Phe Trp Asp Ala Asn Asp Ile Tyr Tyr Glu Gln His Lys Ile Thr
35 40 45

20

Ser Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Ser Glu His Pro Thr
50 55 60

25

Phe Thr Ser Gln Tyr Val Thr Glu His Asp Thr Leu Leu Tyr Asn Leu
65 70 75 80

30

Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His
100 105 110

35

Glu Val Ile Met Arg Glu Phe Asn Ser Tyr Lys Asn Val Arg Arg Ser
115 120 125

40

Trp Glu Glu Leu Lys Ala Arg Asp His Leu Ala Val Leu Gln Ala Arg
130 135 140

45

Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Gln
145 150 155 160

50

Ile Lys Val Arg Val Asp Met Val Glu Leu Lys Arg Lys Met Met Tyr
165 170 175
Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val Tyr Glu Ile
180 185 190

55

Lys Cys Arg Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Gln Tyr Asp
195 200 205

100

Pro Val Ala Ala Leu Phe Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asp
210 215 220

5 Ile Tyr Arg Ile Phe Ala Glu Leu Gln Ala Ile Arg Glu Thr Val Glu
225 230 235 240

10 Leu

15 <210> 314

15 <211> 241

15 <212> PRT

20 <213> synthetic polyepitope peptide

25 <400> 314

25 Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Asn Leu Val Pro Met Val
1 5 10 15

30 Ala Thr Val Asn Val Arg Arg Ser Trp Glu Glu Leu Glu Leu Lys Arg
20 25 30

35 Lys Met Met Tyr Met Val Thr Glu His Asp Thr Leu Leu Tyr Phe Glu
35 40 45

40 Gln Pro Thr Glu Thr Pro Pro Ala Arg Val Tyr Glu Ile Lys Cys Arg
50 55 60

45 Arg Ile Phe Ala Glu Leu Glu Gly Val Val Leu Glu Glu Thr Ser Val
65 70 75 80

50 Met Leu Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Ile Ile
85 90 95

55 Tyr Thr Arg Asn His Glu Val Arg Arg Arg His Arg Gln Asp Ala Leu
100 105 110

55 Ile Met Arg Glu Phe Asn Ser Tyr Lys Gln Ile Lys Val Arg Val Asp
115 120 125

101

Met Val Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Tyr Asp Pro Val
130 135 140

5 Ala Ala Leu Phe Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Glu
145 150 155 160

10 Phe Phe Trp Asp Ala Asn Asp Ile Tyr Tyr Val Lys Tyr Val Tyr Glu
165 170 175

Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Lys Ala Arg Asp His
180 185 190

15

Leu Ala Val Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg
195 200 205

20

Ala Lys Lys Asp Glu Leu Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln
210 215 220

25 Glu Pro Met Ser Ile Tyr Val Tyr Gln Ala Ile Arg Glu Thr Val Glu
225 230 235 240

30

Leu

<210> 315

35 <211> 241

<212> PRT

40 <213> synthetic polyepitope peptide

<400> 315

45 Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Glu Pro Met Ser Ile Tyr
1 5 10 15

50 Val Tyr Glu Leu Lys Arg Lys Met Met Tyr Met Arg Arg Arg His Arg
20 25 30

55 Gln Asp Ala Leu Ala Arg Val Tyr Glu Ile Lys Cys Arg Ala Tyr Ala
35 40 45

Gln Lys Ile Phe Lys Ile Leu Gln Tyr Asp Pro Val Ala Ala Leu Phe

102

50

55

60

5 Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala
65 70 75 80

10 Glu Leu Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Ile Arg
85 90 95

15 Glu Thr Val Glu Leu Asn Val Arg Arg Ser Trp Glu Glu Leu Lys Ala
100 105 110

20 Arg Ala Lys Lys Asp Glu Leu Val Thr Glu His Asp Thr Leu Leu Tyr
115 120 125

25 Asn Leu Val Pro Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val
130 135 140

30 Met Leu Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg
145 150 155 160

35 Asn His Glu Val Ile Met Arg Glu Phe Asn Ser Tyr Lys Gln Ile Lys
165 170 175

40 Val Arg Val Asp Met Val Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr
180 185 190

45 Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala Asn
195 200 205

50 Asp Ile Tyr Lys Ala Arg Asp His Leu Ala Val Leu Gln Ala Arg Leu
210 215 220

55 Thr Val Ser Gly Leu Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val
225 230 235 240

Tyr

50

<210> 316

55 <211> 241

<212> PRT

<213> synthetic polyepitope peptide

5 <400> 316

Gln Ile Lys Val Arg Val Asp Met Val Ala Arg Val Tyr Glu Ile Lys
1 5 10 15

10 Cys Arg Asn Leu Val Pro Met Val Ala Thr Val Tyr Val Lys Tyr Val
20 25 30

15 Tyr Glu Ser Phe Arg Ile Phe Ala Glu Leu Glu Gly Val Tyr Ala Tyr
35 40 45

20 Ile Tyr Thr Thr Tyr Leu Ile Ile Tyr Thr Arg Asn His Glu Val Ile
 50 55 60

Met Arg Glu Phe Asn Ser Tyr Lys Ser Glu His Pro Thr Phe Thr Ser
65 70 75 80

Gln Tyr Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Gln Tyr Asp Pro
85 90 95

30 Val Ala Ala Leu Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Gln Glu
100 105 110

35 Phe Phe Trp Asp Ala Asn Asp Ile Tyr Asn Val Arg Arg Ser Trp Glu
 115 120 125

40 Glu Leu Lys Ala Arg Asp His Leu Ala Val Leu Val Leu Glu Glu Thr
 130 135 140

Ser Val Met Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg
145 150 155 160

Ala Lys Lys Asp Glu Leu Glu Leu Lys Arg Lys Met Met Tyr Met Val
165 170 175

50 Thr Glu His Asp Thr Leu Leu Tyr Gln Glu Pro Met Ser Ile Tyr Val
 180 185 190

55 Tyr Arg Arg His Arg Gln Asp Ala Leu Cys Pro Ser Gln Glu Pro
 195 200 205

104

Met Ser Ile Tyr Val Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr
210 215 220

5 Glu Gln His Lys Ile Thr Ser Tyr Gln Ala Ile Arg Glu Thr Val Glu
225 230 235 240

10 Leu

15 <210> 317

<211> 241

<212> PRT

20 <213> synthetic polyepitope peptide

25 <400> 317

Asp Ile Tyr Arg Ile Phe Ala Glu Leu Cys Pro Ser Gln Glu Pro Met
1 5 10 15

30 Ser Ile Tyr Val Tyr Gln Ala Ile Arg Glu Thr Val Glu Leu Lys Ala
20 25 30

35 Arg Asp His Leu Ala Val Leu Asn Leu Val Pro Met Val Ala Thr Val
35 40 45

40 Tyr Val Lys Tyr Val Tyr Glu Ser Phe Val Leu Glu Glu Thr Ser Val
50 55 60

Met Leu Asn Val Arg Arg Ser Trp Glu Glu Leu Ile Met Arg Glu Phe
65 70 75 80

45 Asn Ser Tyr Lys Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Glu Leu
85 90 95

50 Lys Arg Lys Met Met Tyr Met Gln Tyr Asp Pro Val Ala Ala Leu Phe
100 105 110

55 Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Arg Leu Thr Val
115 120 125

105

Ser Gly Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Gln Ile Lys Val
130 135 140

5 Arg Val Asp Met Val Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg
145 150 155 160

10 Val Tyr Glu Ile Lys Cys Arg Phe Glu Gln Pro Thr Glu Thr Pro Pro
165 170 175

15 Tyr Ala Tyr Ile Tyr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala
180 185 190

20 Asn Asp Ile Tyr Tyr Glu Gln His Lys Ile Thr Ser Tyr Val Thr Glu
195 200 205

25 His Asp Thr Leu Leu Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Arg
210 215 220

30 Val

35 <210> 318

35 <211> 241

35 <212> PRT

40 <213> synthetic polyepitope peptide

45 <400> 318

45 Asn Leu Val Pro Met Val Ala Thr Val Gln Ala Arg Leu Thr Val Ser
1 5 10 15

50 Gly Leu Val Thr Glu His Asp Thr Leu Leu Tyr Tyr Ala Tyr Ile Tyr
20 25 30

55 Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr Val
35 40 45

Leu Glu Glu Thr Ser Val Met Leu Glu Leu Lys Arg Lys Met Met Tyr

106

50

55

60

5 Met Arg Ile Phe Ala Glu Leu Glu Gly Val Gln Glu Pro Met Ser Ile
65 70 75 80

10 Tyr Val Tyr Ile Ile Tyr Thr Arg Asn His Glu Val Ile Met Arg Glu
85 90 95

10

Phe Asn Ser Tyr Lys Arg Arg Arg His Arg Gln Asp Ala Leu Ala Tyr
100 105 110

15

Ala Gln Lys Ile Phe Lys Ile Leu Ser Glu His Pro Thr Phe Thr Ser
115 120 125

20

Gln Tyr Gln Tyr Asp Pro Val Ala Ala Leu Phe Tyr Val Lys Tyr Val
130 135 140

25

Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Asn Val Arg
145 150 155 160

30

Arg Ser Trp Glu Glu Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Ala
165 170 175

35

Arg Val Tyr Glu Ile Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser
180 185 190

Ile Tyr Val Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro Gln Ile Lys
195 200 205

40

Val Arg Val Asp Met Val Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln
210 215 220

45

Ala Ile Arg Glu Thr Val Glu Leu Lys Ala Arg Asp His Leu Ala Val
225 230 235 240

Leu

50

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/00829

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : C07K 14/045; A61K 39/12, 39/295; A61P 31/12; C12N 15/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) STN, Medline, CA, WPIDS, BIOSIS (keywords: polyepitop?, epitop?, cytomegalovirus, CMV, HCMV, cytotoxic T lymphocytes, CTL.)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Journal of Clinical Microbiology, Vol. 32, No. 2, Feb. 1994; Ripalti, A. et al, "Construction of Polyepitopes Fusion Antigens of Human Cytomegalovirus of ppUL32: Reactivity with Human Antibodies", pp. 358-363 See abstract and "materials and methods"	107-112, 142, 147
A	Microbiologica, Vol. 18, 1995; Ripalti, A. et al, "Construction of a polyepitope fusion antigen of Human Cytomegalovirus ppUL32 and detection of specific antibodies by ELISA", pp. 1-12. See summary and "materials and methods"	107-112, 142, 147
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C		<input checked="" type="checkbox"/> See patent family annex
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"B" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 17 October 2002	Date of mailing of the international search report 25 OCT 2002	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer GAVIN THOMPSON Telephone No : (02) 6283 2240	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/00829

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>The Journal of Infectious Diseases, Vol. 181, 2000; Gyulai, Z. et al, "Cytotoxic T Lymphocyte (CTL) Responses to Human Cytomegalovirus pp65, IE1-Exon4, gB, pp150, and pp28 in Healthy Individuals: Reevaluation of Prevalence of IE1-Specific CTLs", pp. 1537-46</p> <p>See abstract</p>	107-112, 142, 147
A	<p>Journal of Clinical Microbiology, Vol. 37, No. 1, Jan. 1999; Greijer, A. et al, "Molecular Fine-Specificity Analysis of Antibody Responses to Human Cytomegalovirus and Design of Novel Synthetic-Peptide-Based Serodiagnostic Assays", pp.179-188</p> <p>See abstract and Table 1.</p>	107-112, 142, 147
A	<p>WO 94/23744 A (THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY and THE GOVERNMENT OF THE UNITED STATES OF AMERICA on behalf of THE DEPARTMENT OF HEALTH AND HUMAN SERVICES) 27 October 1994</p> <p>See abstract</p>	107-112, 142, 147
A	<p>WO 98/21233 A (CITY OF HOPE) 22 May 1998</p> <p>See abstract</p>	107-112, 142, 147
A	<p>WO 01/72782 A (CITY OF HOPE) 4 October 2001</p> <p>See abstract</p>	107-112, 142, 147

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/00829

Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos :
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos : 1 to 106, 113 to 141, 143 to 146, 148 to 270
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
So many peptide sequences are claimed - at least 318 - that a search that is more than 3 to 4 per cent of this total is economically prohibitive.

3. Claims Nos :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See attached sheets (as per attachment to "INVITATION TO PAY ADD. FEES").

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention mentioned in the claims as agreed; it is covered by claims Nos.:

107-112, 142, 147

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU02/00829

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
WO	94/23744	CA	2160583	US	5552143	AT	140154
		CA	2012895	DE	69627695	DK	389286
		EP	389286	ES	2091221	GR	3020765
		US	5591439	WO	94/17810		
WO	98/21233	US	6074645	US	6156317	US	6251399
		AU	74814/98	CA	2308118	EP	1023319
		JP	2001519181	WO	99/19349	WO	01/72782
		AU	49243/01	EP	946592		
WO	01/72782	AU	49243/01	US	6251399	EP	946592
		WO	98/21233				

END OF ANNEX